



Individual differences in mental toughness associate with academic performance and income



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ABSTRACT

Mental toughness (MT) has been related to high performance in competitive situations. The current studies tested whether individual differences in MT were associated with success in two achievement domains: higher education and work. Academic performance and attendance were assessed over three years in a British university sample. MT was associated with higher average academic grades (Study 1). Individual differences in MT predicted individuals' income, controlling for age and gender (Study 2). The results suggest that MT entails positive psychological resources that are important for academic and career success. Future research aiming at exploring the factors that contribute to variation in MT and the mechanisms that underlie the association between MT and achievement may have significant implications for predicting and optimizing performance in various domains.

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There is an increasing amount of evidence showing that personality traits associate with positive outcomes in achievement domains, such as education (Chamorro-Premuzic & Furnham, 2003; Poropat, 2009) and work (Barrick & Mount, 1991). In educational contexts, for example, personality traits have been associated with academic grades, attendance, and peer relationship (Chamorro-Premuzic & Furnham, 2003; Poropat, 2009; St Clair-Thompson et al., 2014). Research indicates that while individual differences in cognitive traits, such as intelligence, are associated with academic performance and learning; individual differences in personality traits may facilitate the use of these cognitive traits contributing indirectly to individual variation in learning (Rindermann & Neubauer, 2001).

The relationship between non-cognitive traits and performance may vary at different phases of life. For example, in educational contexts, personality traits may be stronger predictors of academic performance in higher education in comparison to lower levels of education. Aspects of post-secondary education can be distinct from elementary and secondary education (O'Connor & Paunonen, 2007). For instance, university samples tend to exhibit less individual variation in intellectual ability as a result of students being selected on the basis of similar academic performance at high school (Furnham, Chamorro-Premuzic, & McDougall, 2002). Indeed, the predictive value of cognitive ability for academic performance decreases at higher level of education as

compared to lower levels of education (Furnham et al., 2002; O'Connor & Paunonen, 2007). As such, during post-secondary education, non-cognitive individual differences may become increasingly important during high-stake testing (Ackerman, Bowen, Beier, & Kanfer, 2001).

1. Mental toughness

A personality construct that has grown in popularity in the last decade and has been explored in relation to mental health, organizational and educational outcomes is Mental Toughness (MT) (e.g. Marchant et al., 2009; St Clair-Thompson et al., 2014; Stamp et al., 2015). MT is defined as a multidimensional personality construct, which allows one to remain relatively unaffected by stressors and to strive in challenging situations (Clough, Earle, & Sewell, 2002; Jones & Moorhouse, 2007). It covers a set of positive psychological resources that influence how an individual evaluates and responds to demanding events to consistently achieve his or her goals (Gucciardi, Gordon, & Dimmock, 2009).

The most frequently applied conceptualization of MT is the 4C's model developed by Clough et al. (2002). The 4C's model defines MT in terms of four factors: (1) *Commitment*: the tendency to be involved in pursuing goals despite problems that arise, (2) *Challenge*: the tendency to perceive changes as opportunities of self-development rather than threats to security, (3) *Control* (life and emotion control): the tendency to feel and act as if one is in control of and able to exert influence on the environment, while keeping anxieties in check, and (4) *Confidence*

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(ability and interpersonal): the tendency to believe in one's ability to successfully complete tasks and push themselves forward in social settings. Mentally tough individuals, as described by Clough et al. (2002), tend to remain calm, competitive and confident in the face of adversity or challenge. They have lower anxiety levels than others and firmly believe that they control their own destiny.

2. Mental toughness and achievement

The idea that MT is vital for high achievement is rooted in its empirical and theoretical associations with established predictors of achievement outcomes. The Big Five personality factors have been used extensively to predict achievement across a wide range of domains (Barrick & Mount, 1991; Chamorro-Premuzic & Furnham, 2003; Poropat, 2009). A meta-analysis, with a cumulative sample size of over 70,000 participants, suggests that conscientiousness is a robust predictor of academic performance across academic levels, and that its effect is mostly independent of intelligence (Poropat, 2009). Longitudinal evidence has also suggested that neuroticism predicts negatively academic grades, especially during exams (Chamorro-Premuzic & Furnham, 2003). Similarly, conscientiousness and neuroticism (negatively) have been consistently related to work outcomes including job performance, leadership, and career success (Barrick & Mount, 1991; Judge, Bono, Ilies, & Gerhardt, 2002; Judge, Higgins, Thoresen, & Barrick, 1999). A behavioral genetic study has shown that MT is related to conscientiousness and neuroticism at the phenotypic, genetic and environmental levels (Horsburgh, Schermer, Veselka, & Vernon, 2009).

MT is also conceptually related to the concept of self-efficacy in its core emphasis on self-belief (Madrigal, Hamill, & Gill, 2013). Self-efficacy is a significant determinant of educational performance and adjustment (Chemers, Hu, & Garcia, 2001), academic motivation (McGeown et al., 2014) and work performance in organizational settings (McDonald & Siegall, 1992; Stajkovic & Luthans, 1998). The challenge and control subscale of MT also overlap with resilience, which is the capacity to adapt effectively in a disadvantaged or stressful environment (Egeland, Carlson, & Sroufe, 1993). Resilience is an important correlate of academic attainment, especially in the face of academic adversity (Martin, 2013; Putwain, Nicholson, Connors, & Woods, 2013).

MT may also influence achievement outcomes indirectly by reducing stress levels. Stress impacts cognitive functioning adversely (Arnsten, 2009) and impairs one's ability to perform well academically (Felsten & Wilcox, 1992). In response to a self-select stressor, mentally tough individuals reported more problem-focused coping strategies and fewer emotional focused or avoidance strategies (Kaiseler, Polman, & Nicholls, 2009). Problem-focused coping was associated with greater coping effectiveness. In addition, MT has been related to learned resourcefulness, which is a repertoire of acquired abilities that promote emotional control and stress management (Cowden, Fuller, & Anshel, 2014). Learned resourcefulness has been found to moderate significantly the relationship between academic stress and academic performance (Akgun & Ciarrochi, 2003). Indeed, in a longitudinal study by Gerber et al. (2013), well-adjusted students, who consistently had lower levels of stress, fewer depressive symptoms and higher life satisfaction, reported high levels of MT. A positive association has also been shown between MT and psychological wellbeing among undergraduate students (Stamp et al., 2015). As such, individuals with higher levels of MT might perform better in domains that involve stress and challenges, in comparison to cognitive ability-matched peers with lower levels of MT.

The aforementioned evidence suggests that MT may be a vital resource that fosters coping effectiveness and successful adaptation in the face of challenges and setbacks that arise in life. As such, it should be highly relevant to achievement in demanding contexts. Indeed, MT literature has documented associations between MT and positive

outcomes in educational and organizational contexts. A set of studies by St Clair-Thompson et al. (2014) explored the relationship between MT and school performance among adolescents. Using the 4C's model, it was shown that total MT and the scales of challenge, commitment and control were positively correlated with academic attainment and attendance. Low levels of control of life appeared to be predictive of counterproductive classroom behavior, whereas confidence in abilities and interpersonal confidence were associated with peer relationships (St Clair-Thompson et al., 2014).

To date there is only one study that has explored the degree to which MT associates with academic grades and progression in higher education. Crust et al. (2014) reported significant and positive correlations between total MT, grades, and progression in university sports students. The authors suggested that future studies could explore attendance in relation to MT and that more longitudinal research is needed to track student progress and achievement over the standard three-year duration of undergraduate study (Crust et al., 2014).

The significance of MT in performance is not limited to education, but also extends to the workplace. A recent study by Gucciardi, Hanton, Gordon, Mallett, and Temby (2015) showed that MT was directly related to higher levels of supervisor-rated work performance in a sample of 497 employees in Australia. Perceived stress partially mediated the relationship between mental toughness and work performance. Individuals' level of MT can also play a significant role in career advancement. Marchant et al. (2009) investigated the relationship between mental toughness and managerial positions in a sample of 522 participants working in UK-based organizations. Higher levels of MT were associated with more senior managerial positions and tended to increase with age. Taken together, these findings suggest that individuals with higher levels of mental toughness are likely to achieve more favorable outcomes at work.

3. The current research

The purpose of the current research was to investigate the associations between MT and academic and career success. We expected individual variation in MT to be associated with objective measures of academic and career attainment. To this end, academic attainment was assessed using academic grades over the entire course of tertiary education (Study 1). Objective career success was operationalized as personal annual income (Study 2). Career success can be considered in terms of subjective (intrinsic) and objective (extrinsic) achievements as a result of work experiences (Seibert, Crant, & Kraimer, 1999). While subjective career success is commonly operationalized as self-reported career or job satisfaction, indicators of objective career success include income, promotion and occupational status (Judge, Cable, Boudreau, & Bretz, 1995; Judge et al., 1999). Income is a robust predictor of career satisfaction and other subjective evaluation of success (Judge et al., 1995; Raabe, Frese, & Beehr, 2007). In two studies we tested the following hypotheses:

- (1) MT will be positively associated with university students' grades and attendance (Study 1); and
- (2) MT will be positive associated with individual's job income (Study 2).

3.1. Study 1

In the first study we explored the associations between MT and academic grades and attendance in a sample of British university students. We hypothesized that total MT would be positively correlated with academic grades and attendance over the three-year period of tertiary education.

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